

**QUARTERLY REPORT**

1. **Contract Number:** DAMD17-91-C-1081
2. **Report Date:** 30 August 1991
3. **Reporting Period:** 16 May 1991 through 15 August 1991
4. **Principal Investigator:** Dr. Robert W. Verona
5. **Telephone:** (513) 426-6900; (205) 598-6389
6. **Institution:**  
UES, Inc.  
4401 Dayton-Xenia Road  
Dayton, Ohio 45432
7. **Project Title:** Development of Data Packages on the Human Visual Response with Electro-Optical (EO) Displays
8. **Current staff, with percent effort of each on project from 16 May 1991 through 15 August 1991:**

NAME	NUMBER OF HOURS*	% ON PROJECT**
Robert Verona	472	92.0%
Howard Beasley	232	100.0%
John S. Martin	192	100.0%
Julie B. Wriston	496	96.9%

\*The number of hours available during the reporting period were 512 excluding holidays.

\*\*Does not include sick and annual leave used. And reflects percentage based upon employee start date.

9. **Expenditures from 16 May 1991 through 15 August 1991:**

Personnel	\$38,459.29	Materials	\$2,214.18
Other	\$ 310.00	Travel	\$ 553.70

**TOTAL DIRECT EXPENSES:** \$41,537.17\*

\*G&A, FC, and Fee are not included.

10. **Comments on administrative and logistical matters:**

**Key Personnel:**

Dr. Robert W. Verona was assigned as the UES Project Manager/Engineering Psychologist for this contract, and is devoting 100% of his time to the effort. Dr. Alvarez, our originally proposed candidate for the Research Optometrist key position, accepted and then declined the position because of personal reasons. A similar sequence of events occurred with Dr. Coletta. UES subsequently recruited other Research Optometrists candidates through advertisements and various personal contacts, but none were suitable for the Research Optometrist position on this contract. With the Government's consent, Visual Psychophysicists (Ph.D.s but without Optometry degrees) were also considered for the Research Optometrist position. Many Visual Psychophysicists had superior psychophysics training and experience compared to the remaining Research Optometrist candidates. Dr. Scott Grigsby, a Visual Psychophysicist from Ohio State University was offered the Research Optometrist position, made a visit to USAARL at Ft. Rucker on 21-23 August 1991 and then declined the offer on 27 August 1991. The personnel search is continuing.

**Technicians:**

UES was able to recruit exceptionally capable technicians for this effort. Both of the permanent technicians UES hired, formerly worked at USAARL and had retired from government service. They have exceptionally good technical reputations and are very knowledgeable of the available facilities, GFE equipment, and USAARL standard operating procedures. The two permanent technician positions were vacant for a total of 14.8 weeks, and a temporary technician was hired as a substitute for the permanent technicians for 14.8 weeks. The temporary technician assisted Dr. Verona with the literature search, Initial Program Plan (IPP), database organization, and file set-up.

**11. Scientific Progress:**

The majority of this first quarter has been spent on preparing the Initial Program Plan (IPP), conducting literature searches, organizing the background and reference materials, and setting up the laboratory. The IPP was submitted on 17 June 1991, 30 days after contract award, and was accepted by Dr. Wiley on 27 June 1991.

Literature searches were conducted through the USAARL Scientific Information Center (SIC) for both display measurement and helmet mounted display (HMD) related reports and articles. Almost 200 documents were ordered based on the search results. Most of these documents have been cataloged and entered into an electro-optical reference data base. Titles, authors, keywords, and an abstract for each document can be accessed and manipulated through the Enable database and word processing software.

The laboratory setup process is on-going. Preliminary equipment requirements for the physical and psychophysical measurements were identified based on the IPP. Four categories of equipment were identified: a) equipment on-hand and operational, b) equipment on-hand and requires maintenance and/or calibration, c) requirement definitized and equipment in procurement process, and d) equipment requirement not definitized.

The Government Furnished Equipment (GFE) computer, printer, and software and the two UES-owned computers are in place. New GFE was ordered with delivery expected to be in September. The new GFE includes optical tables, light sources, translation devices, video equipment, and light measurement equipment. Most of the other GFE was drawn from excess property. This equipment was repaired and/or calibrated and is now ready for service. Technicians' tools and other equipment and supply items identified on the contract as "contractor furnished" have been procured and are in place.

Work orders have been placed with the USAARL machine shop to construct the brackets required for the integration of various light detectors and computer controlled mechanical scanning platforms. Preliminary display measurements were made using breadboard hardware to validate the mechanical configurations before committing permanent fixtures.

Our experience in interfacing and trouble shooting computer/controller hardware for the display measurements will be directly applicable to the psychophysical experiments which require precise control and measurement of the visual stimuli. We are developing program modules for driving scanners, relay closures, digital-to-analog and analog-to-digital converters, counters, and voltmeters.

12. **Milestones:**

The development of the EO system evaluation plan is over a month ahead of schedule since additional resources from the psychophysical part of the effort have been available. The development of the psychophysical study protocol is about two months behind schedule due to the absence of the Research Optometrist. During the next quarter, we will focus our attention on the psychophysical portion of the effort and synchronize both the physical and psychophysical measurement portions of the program and regain our schedule.